AMENDMENTS TO THE DRAWINGS

Applicants have amended Figure 1 to include a sequence identifier in the figure. An annotated copy and a replacement sheet of Figure 1 are attached hereto.

REMARKS

Claims 23-44 are pending in this application. Claims 23-31 and 41-44 have been withdrawn from consideration by the Examiner as directed to non-elected subject matter. Claims 32-40 have been examined on their merits and stand rejected. Specifically, the claims have been rejected as anticipated or unpatentable in view of the cited references. Additionally, objections have been asserted against the specification and drawings. In view of the amendments above and remarks below, Applicants respectfully request reconsideration and withdrawal of the objections and rejections.

REJECTION UNDER 35 U.S.C. § 102

Claims 32-36, 38, and 40 have been rejected as being anticipated by Kim[1].

Claim 32 is directed to a composition comprising a synthetic protein. The protein comprises an amino acid sequence that is at least 80% identical to at least 46 contiguous amino acids of a naturally occurring antigenic protein of a pathogen or tumor, wherein the composition is free of a nucleic acid encoding the amino acid sequence. Claims 33-36, 38, and 40 depend directly or indirectly from claim 32.

Kim discloses administering HPV 16 E7 and CpG-oligodeoxynucleotide to mice.[2] This administration allowed mice to suppress TC-1 tumor growth (an E7-expressing tumorgenic cell line).[3] The Examiner acknowledges that Kim does not synthetically produce the protein, but contends that the protein generated by the mice treated with E7+OBN is expected to have the same properties and at least 80% identify to SEQ ID NO: 1.[4]

Applicants respectfully disagree. Biologics are large complicated molecules having tertiary, if not quaternary, structures that depend on the method of synthesis, and may

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[1] Tae-Yoon Kim *et al.*, "Both E7 and CpG-oligodeoxynucleotide are required for protective immunity against challenge with human papillomavirus 16 (E6/E7) immortalized tumor cells: involvement of CD4+ and CD8+ T cells in protection," CANCER RESEARCH (Dec. 15, 2002) 62: 7234-7240 ("Kim").

[2] Kim at page 7235.

[3] Kim at pages 7235-7236.

[4] Office Action at page 4.

further include contaminants resulting from the method of synthesis. A protein manufactured via recombinant methods would be expected to be distinct from the same protein produced synthetically. For example, a recombinant protein may contain impurities originating from the producing host cell. Such impurities include DNA and toxins. Each of these impurities may influence the immunogenicity of the protein preparation and can negatively affect their use.

Although Kim is silent regarding impurities, it is clear that the HPV 16 E7 antigen was made via recombinant techniques. Likewise, it is likely that these techniques incorporated impurities, such as nucleic acids. Thus, absent some additional teaching, one of ordinary skill would understand Kim as using a recombinant E7 protein that contains impurities such as nucleic acids. Since claim 32 recites that the synthetic protein is free of nucleic acids, Kim does not teach each and every limitation recited in the claims.

This is further established by Kim's data. On page 7235, Kim states that the molecular mass of the protein is 23 kDa, and that "the 23 kDa protein was larger in size than predicted (11 kDa of E7 protein plus 4 kDa protein of His-tagged regions in the pET vector system)."[5] One would conclude that the recombinant E7 protein produced is distinct from the synthetic one recited in the claims.

Another distinction is that Kim's E7 protein has a His-tag, which also increases the molecular weight of the protein. In fact, the His-tag represents approximately a 37% increase in the size of the E7 protein. Thus, in addition to the mysterious 8 kDa of mass, Kim also teaches the addition of 4 kDa of protein that is not part of the synthetic protein. These two parts may affect the immunogenicity of the formed protein.

For these reasons, Kim's recombinant E7 protein is structurally different from the synthetic protein recited in the claims. Accordingly, Kim does not teach each and every limitation recited in the claims, and therefore, does not anticipate the claims. For these reasons, reconsideration and withdrawal of these rejections is respectfully requested.

[5] Kim at page 7235.

REJECTION UNDER 35 U.S.C. § 103

Claim 39 has been rejected under 35 U.S.C. § 103 as being unpatentable over Kim in view of Zwaveling[6] and Turner[7]. As discussed above, Kim does not teach each and every element recited in claim 32. Claim 39 depends from claim 32. Thus, for the reasons discussed above, claim 39 is also patentable over the cited references.

OBJECTION TO THE SPECIFICATION

The specification has been objected to as containing amino acid sequences that are not identified with a sequence identifier. The Applicants have amended the specification to include a sequence identifier for these amino acid sequences. Accordingly, withdrawal of this objection is respectfully requested.

OBJECTION TO THE DRAWINGS

Figure 1 has been objected to as containing an amino acid sequence that is not identified with a sequence identifier. Applicants have amended Figure 1 to include a sequence identifier. Accordingly, withdrawal of this objection is respectfully requested.

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[6] Sander Zwaveling *et al.*, "Established human papillomavirus type 16-expressing tumors are effectively eradicated following vaccination with long peptides," J. OF IMMUN. (2002) 169: 350-358 ("Zwaveling").

[7] Joel G. Turner *et al.*, "Anti-CD40 antibody induces antitumor and antimetastic effects: the role of NK cells," J. OF IMMUN. (2001) 166: 89-94 ("Turner").

CONCLUSION

In view of the amendments and remarks above, Applicants respectfully request reconsideration and withdrawal of the objections and rejections, allowance of pending claims 32-40 and rejoinder of claims 23-31 and 41-44.

Respectfully submitted,

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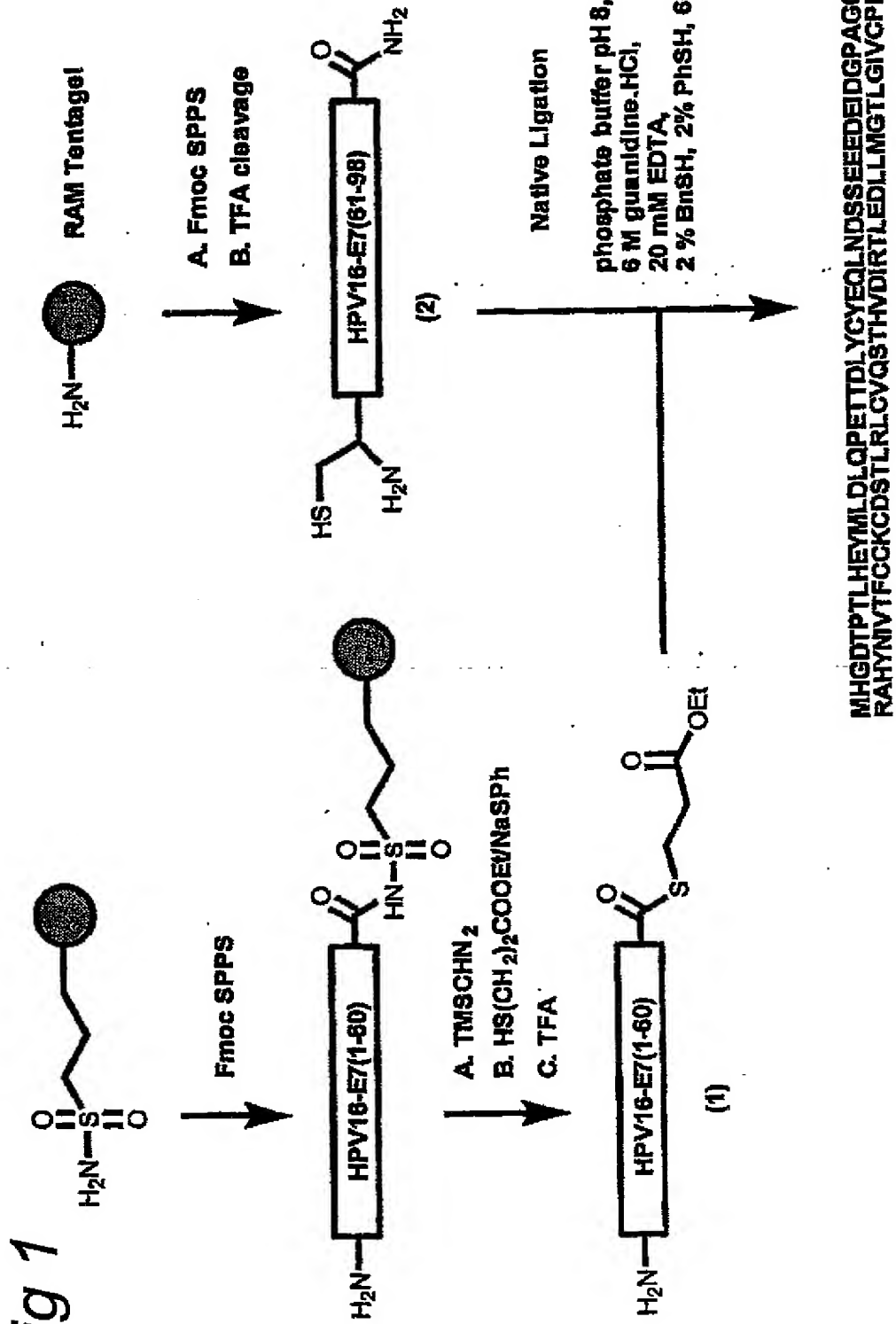
Fig 1



(3) HPV16-E7 (SEQ ID NO: 1)